

SEQUENCE LISTING

<110> Myriad Genetics, Inc.  
5 Shattuck, Donna  
Russell, Deanna  
Abkevich, Victor  
Neff, Chris

10 <120> Depression Gene

<130> 1309.03

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15 <170> PatentIn version 3.0

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1 5 10 15

gaa aag gac atc aag aca tcc tac atc atg gat cac atg att agt gat  
96

Glu Lys Asp Ile Lys Thr Ser Tyr Ile Met Asp His Met Ile Ser Asp  
20 25 30

5

gga ttt tta aca ata tca gaa gag gaa aaa gta aga aat gag ccc act  
144

Gly Phe Leu Thr Ile Ser Glu Glu Glu Lys Val Arg Asn Glu Pro Thr  
35 40 45

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caa cag caa aga gca gct atg ctg att aaa atg ata ctt aaa aaa gat  
192

Gln Gln Gln Arg Ala Ala Met Leu Ile Lys Met Ile Leu Lys Lys Asp  
50 55 60

15

aat gat tcc tac gta tca ttc tac aat gct cta cta cat gaa gga tat  
240

Asn Asp Ser Tyr Val Ser Phe Tyr Asn Ala Leu Leu His Glu Gly Tyr  
65 70 75 80

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aaa gat ctt gct gcc ctt ctc cat gat ggc att cct gtt gtc tct tct  
288

Lys Asp Leu Ala Ala Leu Leu His Asp Gly Ile Pro Val Val Ser Ser  
85 90 95

25

tcc agt ggt aaa gat tca gtt agt gga ata act tcg tat gta agg aca  
336

Ser Ser Gly Lys Asp Ser Val Ser Gly Ile Thr Ser Tyr Val Arg Thr  
100 105 110

30

gtc ctg tgt gaa ggt gga gta cca cag agg cca gtt gtt ttt gtc aca  
384

Val Leu Cys Glu Gly Gly Val Pro Gln Arg Pro Val Val Phe Val Thr

	115	120	125
	agg aag aag ctg gtg aat gca att cag cag aag ctc tcc aaa ttg aaa		
	432		
5	Arg Lys Lys Leu Val Asn Ala Ile Gln Gln Lys Leu Ser Lys Leu Lys		
	130	135	140
	ggg gaa cca gga tgg gtc acc ata cat gga atg gca ggc tgt ggg aag		
	480		
10	Gly Glu Pro Gly Trp Val Thr Ile His Gly Met Ala Gly Cys Gly Lys		
	145	150	155 160
	tct gta tta gct gca gaa gct gtt aga gat cat tcc ctt tta gaa ggt		
	528		
15	Ser Val Leu Ala Ala Glu Ala Val Arg Asp His Ser Leu Leu Glu Gly		
	165	170	175
	tgt ttc cca ggg gga gtg cat tgg gtt tca gtt ggg aaa caa gac aaa		
	576		
20	Cys Phe Pro Gly Gly Val His Trp Val Ser Val Gly Lys Gln Asp Lys		
	180	185	190
	tct ggg ctt ctg atg aaa ctg cag aat ctt tgc aca cgg ttg gat cag		
	624		
25	Ser Gly Leu Leu Met Lys Leu Gln Asn Leu Cys Thr Arg Leu Asp Gln		
	195	200	205
	gat gag agt ttt tcc cag agg ctt cca ctt aat att gaa gag gct aaa		
	672		
30	Asp Glu Ser Phe Ser Gln Arg Leu Pro Leu Asn Ile Glu Glu Ala Lys		
	210	215	220

gac cgt ctc cgc att ctg atg ctt cgc aaa cac cca agg tct ctc ttg  
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Asp Arg Leu Arg Ile Leu Met Leu Arg Lys His Pro Arg Ser Leu Leu  
225 230 235 240  
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atc ttg gat gat gtt tgg gac tct tgg gtg ttg aaa gct ttt gac agt  
768  
Ile Leu Asp Asp Val Trp Asp Ser Trp Val Leu Lys Ala Phe Asp Ser  
245 250 255  
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cag tgt cag att ctt ctt aca acc aga gac aag agt gtt aca gat tca  
816  
Gln Cys Gln Ile Leu Leu Thr Thr Arg Asp Lys Ser Val Thr Asp Ser  
260 265 270  
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gta atg ggt cct aaa tat gta gtc cct gtg gag agt tcc tta gga aag  
864  
Val Met Gly Pro Lys Tyr Val Val Pro Val Glu Ser Ser Leu Gly Lys  
275 280 285  
20  
gaa aaa gga ctt gaa att tta tcc ctt ttt gtt aat atg aag aag gca  
912  
Glu Lys Gly Leu Glu Ile Leu Ser Leu Phe Val Asn Met Lys Lys Ala  
290 295 300  
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gat ttg cca gaa caa gct cat agt att ata aaa gaa tgt aaa ggc tct  
960  
Asp Leu Pro Glu Gln Ala His Ser Ile Ile Lys Glu Cys Lys Gly Ser  
305 310 315 320  
30  
ccc ctt gta gta tct tta att ggt gca ctt tta cgt gat ttt ccc aat  
1008  
Pro Leu Val Val Ser Leu Ile Gly Ala Leu Leu Arg Asp Phe Pro Asn

	325	330	335
	cgc tgg gag tac tac ctc aaa cag ctt cag aat aag cag ttt aag aga		
	1056		
5	Arg Trp Glu Tyr Tyr Leu Lys Gln Leu Gln Asn Lys Gln Phe Lys Arg		
	340	345	350
	ata agg aaa tct tcg tct tat gat tat gag gct cta gat gaa gcc atg		
	1104		
10	Ile Arg Lys Ser Ser Ser Tyr Asp Tyr Glu Ala Leu Asp Glu Ala Met		
	355	360	365
	tct ata agt gtt gaa atg ctc aga gaa gac atc aaa gat tat tac aca		
	1152		
15	Ser Ile Ser Val Glu Met Leu Arg Glu Asp Ile Lys Asp Tyr Tyr Thr		
	370	375	380
	gat ctt tcc atc ctt cag aag gac gtt aag gtg cct aca aag gtg tta		
	1200		
20	Asp Leu Ser Ile Leu Gln Lys Asp Val Lys Val Pro Thr Lys Val Leu		
	385	390	395 400
	tgt att ctc tgg gac atg gaa act gaa gaa gtt gaa gac ata ctg cag		
	1248		
25	Cys Ile Leu Trp Asp Met Glu Thr Glu Glu Val Glu Asp Ile Leu Gln		
	405	410	415
	gag ttt gta aat aag tct ctt tta ttc tgt gat cgg aat gga aag tcg		
	1296		
30	Glu Phe Val Asn Lys Ser Leu Leu Phe Cys Asp Arg Asn Gly Lys Ser		
	420	425	430

ttt cgt tat tat tta cat gat ctt caa gta gat ttt ctt aca gag aag

1344

Phe Arg Tyr Tyr Leu His Asp Leu Gln Val Asp Phe Leu Thr Glu Lys

435

440

445

5

aat tgc agc cag ctt cag gat cta cat aag aag ata atc act cag ttt

1392

Asn Cys Ser Gln Leu Gln Asp Leu His Lys Lys Ile Ile Thr Gln Phe

450

455

460

10

cag aga tat cac cag ccg cat act ctt tca cca gat cag gaa gac tgt

1440

Gln Arg Tyr His Gln Pro His Thr Leu Ser Pro Asp Gln Glu Asp Cys

465

470

475

480

15

atg tat tgg tac aac ttt ctg gcc tat cac atg gcc agt gcc aag atg

1488

Met Tyr Trp Tyr Asn Phe Leu Ala Tyr His Met Ala Ser Ala Lys Met

485

490

495

20

cac aag gaa ctt tgt gct tta atg ttt tcc ctg gat tgg att aaa gca

1536

His Lys Glu Leu Cys Ala Leu Met Phe Ser Leu Asp Trp Ile Lys Ala

500

505

510

25

aaa aca gaa ctt gta ggc cct gct cat ctg att cat gaa ttt gtg gaa

1584

Lys Thr Glu Leu Val Gly Pro Ala His Leu Ile His Glu Phe Val Glu

515

520

525

30

tac aga cat ata cta gat gaa aag gat tgt gca gtc agt gag aat ttt

1632

Tyr Arg His Ile Leu Asp Glu Lys Asp Cys Ala Val Ser Glu Asn Phe

	530	535	540
	cag gag ttt tta tct tta aat gga cac ctt ctt gga cga cag cca ttt		
	1680		
5	Gln Glu Phe Leu Ser Leu Asn Gly His Leu Leu Gly Arg Gln Pro Phe		
	545	550	555 560
	cct aat att gta caa ctg ggt ctc tgt gag ccg gaa act tca gaa gtt		
	1728		
10	Pro Asn Ile Val Gln Leu Gly Leu Cys Glu Pro Glu Thr Ser Glu Val		
	565	570	575
	tat cag caa gct aag ctg cag gcc aag cag gag gtc gat aat gga atg		
	1776		
15	Tyr Gln Gln Ala Lys Leu Gln Ala Lys Gln Glu Val Asp Asn Gly Met		
	580	585	590
	ctt tac ctg gaa tgg ata aac aaa aaa aac atc acg aat ctt tcc cgc		
	1824		
20	Leu Tyr Leu Glu Trp Ile Asn Lys Lys Asn Ile Thr Asn Leu Ser Arg		
	595	600	605
	tta gtt gtc cgc ccc cac aca gat gct gtt tac cat gcc tgc ttt tct		
	1872		
25	Leu Val Val Arg Pro His Thr Asp Ala Val Tyr His Ala Cys Phe Ser		
	610	615	620
	gag gat ggt cag aga ata gct tct tgt gga gct gat aaa acc tta cag		
	1920		
30	Glu Asp Gly Gln Arg Ile Ala Ser Cys Gly Ala Asp Lys Thr Leu Gln		
	625	630	635 640

gtg ttc aaa gct gaa aca gga gag aaa ctt cta gaa atc aag gct cat  
1968

Val Phe Lys Ala Glu Thr Gly Glu Lys Leu Leu Glu Ile Lys Ala His  
645 650 655

5

gag gat gaa gtg ctt tgt tgt gca ttc tct aca gat gac aga ttt ata  
2016

Glu Asp Glu Val Leu Cys Cys Ala Phe Ser Thr Asp Asp Arg Phe Ile  
660 665 670

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gca acc tgc tca gtg gat aaa aaa gtg aag att tgg aat tct atg act  
2064

Ala Thr Cys Ser Val Asp Lys Lys Val Lys Ile Trp Asn Ser Met Thr  
675 680 685

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ggg gaa cta gta cac acc tat gat gag cac tca gag caa gtc aat tgc  
2112

Gly Glu Leu Val His Thr Tyr Asp Glu His Ser Glu Gln Val Asn Cys  
690 695 700

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tgc cat ttc acc aac agt agt cat cat ctt ctc tta gcc act ggg tca  
2160

Cys His Phe Thr Asn Ser Ser His His Leu Leu Leu Ala Thr Gly Ser  
705 710 715 720

25

agt gac tgc ttc ctc aaa ctt tgg gat ttg aat caa aaa gaa tgt cga  
2208

Ser Asp Cys Phe Leu Lys Leu Trp Asp Leu Asn Gln Lys Glu Cys Arg  
725 730 735

30

aat acc atg ttt ggt cat aca aat tca gtc aat cac tgc aga ttt tca  
2256

Asn Thr Met Phe Gly His Thr Asn Ser Val Asn His Cys Arg Phe Ser



	740	745	750
	cca gat gat aag ctt ttg gct agt tgt tca gct gat gga acc tta aag		
	2304		
5	Pro Asp Asp Lys Leu Leu Ala Ser Cys Ser Ala Asp Gly Thr Leu Lys		
	755	760	765
	ctt tgg gat gcg aca tca gca aat gag agg aaa agc att aat gtg aaa		
	2352		
10	Leu Trp Asp Ala Thr Ser Ala Asn Glu Arg Lys Ser Ile Asn Val Lys		
	770	775	780
	cag ttc ttc cta aat ttg gag gac cct caa gag gat atg gaa gtg ata		
	2400		
15	Gln Phe Phe Leu Asn Leu Glu Asp Pro Gln Glu Asp Met Glu Val Ile		
	785	790	795 800
	gtg aag tgt tgt tcg tgg tct gct gat ggt gca agg ata atg gtg gca		
	2448		
20	Val Lys Cys Cys Ser Trp Ser Ala Asp Gly Ala Arg Ile Met Val Ala		
	805	810	815
	gca aaa aat aaa atc ttt ctt ttt gac att cat act agt ggc cta ttg		
	2496		
25	Ala Lys Asn Lys Ile Phe Leu Phe Asp Ile His Thr Ser Gly Leu Leu		
	820	825	830
	gga gaa atc cac acg ggc cat cac agc acc atc cag tac tgt gac ttc		
	2544		
30	Gly Glu Ile His Thr Gly His His Ser Thr Ile Gln Tyr Cys Asp Phe		
	835	840	845

tcc cca caa aac cat ttg gca gtg gtt gct ttg tcc cag tac tgt gta  
2592

Ser Pro Gln Asn His Leu Ala Val Val Ala Leu Ser Gln Tyr Cys Val  
850 855 860

5

gag ttg tgg aat aca gac tca cgt tca aag gtg gct gat tgc aga gga  
2640

Glu Leu Trp Asn Thr Asp Ser Arg Ser Lys Val Ala Asp Cys Arg Gly  
865 870 875 880

10

cat tta agt tgg gtt cat ggt gtg atg ttt tct cct gat gga tca tca  
2688

His Leu Ser Trp Val His Gly Val Met Phe Ser Pro Asp Gly Ser Ser  
885 890 895

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ttt ttg aca tct tct gat gac cag aca atc agg ctc tgg gag aca aag  
2736

Phe Leu Thr Ser Ser Asp Asp Gln Thr Ile Arg Leu Trp Glu Thr Lys  
900 905 910

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aaa gta tgt aag aac tct gct gta atg tta aag caa gaa gta gat gtt  
2784

Lys Val Cys Lys Asn Ser Ala Val Met Leu Lys Gln Glu Val Asp Val  
915 920 925

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gtg ttt caa gaa aat gaa gtg atg gtc ctt gca gtt gac cat ata aga  
2832

Val Phe Gln Glu Asn Glu Val Met Val Leu Ala Val Asp His Ile Arg  
930 935 940

30

cgt ctg caa ctc att aat gga aga aca ggt cag att gat tat ctg act  
2880

Arg Leu Gln Leu Ile Asn Gly Arg Thr Gly Gln Ile Asp Tyr Leu Thr



aaa aat tca aga ctg ctt tct tgg tca ttt gat gga aca gtg aag

3204

Lys Asn Ser Arg Leu Leu Ser Trp Ser Phe Asp Gly Thr Val Lys  
1055 1060 1065

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gta tgg aat att att act gga aat aaa gaa aaa gac ttt gtc tgt

3249

Val Trp Asn Ile Ile Thr Gly Asn Lys Glu Lys Asp Phe Val Cys  
1070 1075 1080

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cac cag ggt aca gta ctt tct tgt gac att tct cac gat gct acc

3294

His Gln Gly Thr Val Leu Ser Cys Asp Ile Ser His Asp Ala Thr  
1085 1090 1095

15

aag ttt tca tct acc tct gct gac aag act gca aag atc tgg agt

3339

Lys Phe Ser Ser Thr Ser Ala Asp Lys Thr Ala Lys Ile Trp Ser  
1100 1105 1110

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ttt gat ctc ctt ttg cca ctt cat gaa ttg agg ggc cac aac ggc

3384

Phe Asp Leu Leu Leu Pro Leu His Glu Leu Arg Gly His Asn Gly  
1115 1120 1125

25

tgt gtg cgc tgc tct gcc ttc tct gtg gac agt acc ctg ctg gca

3429

Cys Val Arg Cys Ser Ala Phe Ser Val Asp Ser Thr Leu Leu Ala  
1130 1135 1140

30

acg gga gat gac aat gga gaa atc agg ata tgg aat gtc tca aac

3474

Thr Gly Asp Asp Asn Gly Glu Ile Arg Ile Trp Asn Val Ser Asn

	1145	1150	1155
	ggt gag ctt ctt cat ttg tgt gct ccg ctt tca gaa gaa gga gct		
	3519		
5	Gly Glu Leu Leu His Leu Cys Ala Pro Leu Ser Glu Glu Gly Ala		
	1160	1165	1170
	gct acc cat gga ggc tgg gtg act gac ctt tgc ttt tct cca gat		
	3564		
10	Ala Thr His Gly Gly Trp Val Thr Asp Leu Cys Phe Ser Pro Asp		
	1175	1180	1185
	ggc aaa atg ctt atc tct gct gga gga tat att aag tgg tgg aac		
	3609		
15	Gly Lys Met Leu Ile Ser Ala Gly Gly Tyr Ile Lys Trp Trp Asn		
	1190	1195	1200
	gtt gtc act ggg gaa tcc tca cag acc ttc tac aca aat gga acc		
	3654		
20	Val Val Thr Gly Glu Ser Ser Gln Thr Phe Tyr Thr Asn Gly Thr		
	1205	1210	1215
	aat ctt aag aaa ata cac gtg tcc cct gac ttc aaa aca tat gtg		
	3699		
25	Asn Leu Lys Lys Ile His Val Ser Pro Asp Phe Lys Thr Tyr Val		
	1220	1225	1230
	act gtg gat aat ctt ggt att tta tat att tta cag act tta gaa		
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30	Thr Val Asp Asn Leu Gly Ile Leu Tyr Ile Leu Gln Thr Leu Glu		
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3747

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Glu Lys Asp Ile Lys Thr Ser Tyr Ile Met Asp His Met Ile Ser Asp  
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15 Gly Phe Leu Thr Ile Ser Glu Glu Glu Lys Val Arg Asn Glu Pro Thr  
35 40 45

Gln Gln Gln Arg Ala Ala Met Leu Ile Lys Met Ile Leu Lys Lys Asp  
20 50 55 60

Asn Asp Ser Tyr Val Ser Phe Tyr Asn Ala Leu Leu His Glu Gly Tyr  
65 70 75 80

25 Lys Asp Leu Ala Ala Leu Leu His Asp Gly Ile Pro Val Val Ser Ser  
85 90 95

Ser Ser Gly Lys Asp Ser Val Ser Gly Ile Thr Ser Tyr Val Arg Thr  
100 105 110

30 Val Leu Cys Glu Gly Gly Val Pro Gln Arg Pro Val Val Phe Val Thr  
115 120 125

Arg Lys Lys Leu Val Asn Ala Ile Gln Gln Lys Leu Ser Lys Leu Lys  
130 135 140

Gly Glu Pro Gly Trp Val Thr Ile His Gly Met Ala Gly Cys Gly Lys  
5 145 150 155 160

Ser Val Leu Ala Ala Glu Ala Val Arg Asp His Ser Leu Leu Glu Gly  
165 170 175

10 Cys Phe Pro Gly Gly Val His Trp Val Ser Val Gly Lys Gln Asp Lys  
180 185 190

Ser Gly Leu Leu Met Lys Leu Gln Asn Leu Cys Thr Arg Leu Asp Gln  
195 200 205

15 Asp Glu Ser Phe Ser Gln Arg Leu Pro Leu Asn Ile Glu Glu Ala Lys  
210 215 220

Asp Arg Leu Arg Ile Leu Met Leu Arg Lys His Pro Arg Ser Leu Leu  
20 225 230 235 240

Ile Leu Asp Asp Val Trp Asp Ser Trp Val Leu Lys Ala Phe Asp Ser  
245 250 255

25 Gln Cys Gln Ile Leu Leu Thr Thr Arg Asp Lys Ser Val Thr Asp Ser  
260 265 270

Val Met Gly Pro Lys Tyr Val Val Pro Val Glu Ser Ser Leu Gly Lys  
275 280 285

30 Glu Lys Gly Leu Glu Ile Leu Ser Leu Phe Val Asn Met Lys Lys Ala  
290 295 300

Asp Leu Pro Glu Gln Ala His Ser Ile Ile Lys Glu Cys Lys Gly Ser  
305 310 315 320

Pro Leu Val Val Ser Leu Ile Gly Ala Leu Leu Arg Asp Phe Pro Asn  
5 325 330 335

Arg Trp Glu Tyr Tyr Leu Lys Gln Leu Gln Asn Lys Gln Phe Lys Arg  
340 345 350

10 Ile Arg Lys Ser Ser Ser Tyr Asp Tyr Glu Ala Leu Asp Glu Ala Met  
355 360 365

Ser Ile Ser Val Glu Met Leu Arg Glu Asp Ile Lys Asp Tyr Tyr Thr  
370 375 380

15 Asp Leu Ser Ile Leu Gln Lys Asp Val Lys Val Pro Thr Lys Val Leu  
385 390 395 400

Cys Ile Leu Trp Asp Met Glu Thr Glu Glu Val Glu Asp Ile Leu Gln  
20 405 410 415

Glu Phe Val Asn Lys Ser Leu Leu Phe Cys Asp Arg Asn Gly Lys Ser  
420 425 430

25 Phe Arg Tyr Tyr Leu His Asp Leu Gln Val Asp Phe Leu Thr Glu Lys  
435 440 445

Asn Cys Ser Gln Leu Gln Asp Leu His Lys Lys Ile Ile Thr Gln Phe  
450 455 460

30 Gln Arg Tyr His Gln Pro His Thr Leu Ser Pro Asp Gln Glu Asp Cys  
465 470 475 480



Met Tyr Trp Tyr Asn Phe Leu Ala Tyr His Met Ala Ser Ala Lys Met  
485 490 495

His Lys Glu Leu Cys Ala Leu Met Phe Ser Leu Asp Trp Ile Lys Ala  
500 505 510

5 Lys Thr Glu Leu Val Gly Pro Ala His Leu Ile His Glu Phe Val Glu  
515 520 525

10 Tyr Arg His Ile Leu Asp Glu Lys Asp Cys Ala Val Ser Glu Asn Phe  
530 535 540

Gln Glu Phe Leu Ser Leu Asn Gly His Leu Leu Gly Arg Gln Pro Phe  
545 550 555 560

15 Pro Asn Ile Val Gln Leu Gly Leu Cys Glu Pro Glu Thr Ser Glu Val  
565 570 575

Tyr Gln Gln Ala Lys Leu Gln Ala Lys Gln Glu Val Asp Asn Gly Met  
580 585 590

20 Leu Tyr Leu Glu Trp Ile Asn Lys Lys Asn Ile Thr Asn Leu Ser Arg  
595 600 605

25 Leu Val Val Arg Pro His Thr Asp Ala Val Tyr His Ala Cys Phe Ser  
610 615 620

Glu Asp Gly Gln Arg Ile Ala Ser Cys Gly Ala Asp Lys Thr Leu Gln  
625 630 635 640

30 Val Phe Lys Ala Glu Thr Gly Glu Lys Leu Leu Glu Ile Lys Ala His  
645 650 655

Glu Asp Glu Val Leu Cys Cys Ala Phe Ser Thr Asp Asp Arg Phe Ile  
660 665 670

5 Ala Thr Cys Ser Val Asp Lys Lys Val Lys Ile Trp Asn Ser Met Thr  
675 680 685

Gly Glu Leu Val His Thr Tyr Asp Glu His Ser Glu Gln Val Asn Cys  
690 695 700

10 Cys His Phe Thr Asn Ser Ser His His Leu Leu Leu Ala Thr Gly Ser  
705 710 715 720

Ser Asp Cys Phe Leu Lys Leu Trp Asp Leu Asn Gln Lys Glu Cys Arg  
725 730 735

15 Asn Thr Met Phe Gly His Thr Asn Ser Val Asn His Cys Arg Phe Ser  
740 745 750

Pro Asp Asp Lys Leu Leu Ala Ser Cys Ser Ala Asp Gly Thr Leu Lys  
20 755 760 765

Leu Trp Asp Ala Thr Ser Ala Asn Glu Arg Lys Ser Ile Asn Val Lys  
770 775 780

25 Gln Phe Phe Leu Asn Leu Glu Asp Pro Gln Glu Asp Met Glu Val Ile  
785 790 795 800

Val Lys Cys Cys Ser Trp Ser Ala Asp Gly Ala Arg Ile Met Val Ala  
805 810 815

30 Ala Lys Asn Lys Ile Phe Leu Phe Asp Ile His Thr Ser Gly Leu Leu  
820 825 830

Gly Glu Ile His Thr Gly His His Ser Thr Ile Gln Tyr Cys Asp Phe  
835 840 845

Ser Pro Gln Asn His Leu Ala Val Val Ala Leu Ser Gln Tyr Cys Val  
5 850 855 860

Glu Leu Trp Asn Thr Asp Ser Arg Ser Lys Val Ala Asp Cys Arg Gly  
865 870 875 880

10 His Leu Ser Trp Val His Gly Val Met Phe Ser Pro Asp Gly Ser Ser  
885 890 895

Phe Leu Thr Ser Ser Asp Asp Gln Thr Ile Arg Leu Trp Glu Thr Lys  
900 905 910

15 Lys Val Cys Lys Asn Ser Ala Val Met Leu Lys Gln Glu Val Asp Val  
915 920 925

Val Phe Gln Glu Asn Glu Val Met Val Leu Ala Val Asp His Ile Arg  
20 930 935 940

Arg Leu Gln Leu Ile Asn Gly Arg Thr Gly Gln Ile Asp Tyr Leu Thr  
945 950 955 960

25 Glu Ala Gln Val Ser Cys Cys Cys Leu Ser Pro His Leu Gln Tyr Ile  
965 970 975

Ala Phe Gly Asp Glu Asn Gly Ala Ile Glu Ile Leu Glu Leu Val Asn  
980 985 990

30 Asn Arg Ile Phe Gln Ser Arg Phe Gln His Lys Lys Thr Val Trp  
His  
995 1000 1005

Ile Gln Phe Thr Ala Asp Glu Lys Thr Leu Ile Ser Ser Ser Asp  
1010 1015 1020

5 Asp Ala Glu Ile Gln Val Trp Asn Trp Gln Leu Asp Lys Cys Ile  
1025 1030 1035

Phe Leu Arg Gly His Gln Glu Thr Val Lys Asp Phe Arg Leu Leu  
1040 1045 1050

10 Lys Asn Ser Arg Leu Leu Ser Trp Ser Phe Asp Gly Thr Val Lys  
1055 1060 1065

Val Trp Asn Ile Ile Thr Gly Asn Lys Glu Lys Asp Phe Val Cys  
15 1070 1075 1080

His Gln Gly Thr Val Leu Ser Cys Asp Ile Ser His Asp Ala Thr  
1085 1090 1095

20 Lys Phe Ser Ser Thr Ser Ala Asp Lys Thr Ala Lys Ile Trp Ser  
1100 1105 1110

Phe Asp Leu Leu Leu Pro Leu His Glu Leu Arg Gly His Asn Gly  
1115 1120 1125

25 Cys Val Arg Cys Ser Ala Phe Ser Val Asp Ser Thr Leu Leu Ala  
1130 1135 1140

Thr Gly Asp Asp Asn Gly Glu Ile Arg Ile Trp Asn Val Ser Asn  
30 1145 1150 1155

Gly Glu Leu Leu His Leu Cys Ala Pro Leu Ser Glu Glu Gly Ala  
1160 1165 1170

Ala Thr His Gly Gly Trp Val Thr Asp Leu Cys Phe Ser Pro Asp  
1175 1180 1185

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1190 1195 1200

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1205 1210 1215

10 Asn Leu Lys Lys Ile His Val Ser Pro Asp Phe Lys Thr Tyr Val  
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15 1235 1240 1245

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Gly Phe Leu Thr Ile Ser Glu Glu Glu Lys Val Arg Asn Glu Pro Thr  
30 35 40 45

Gln Gln Gln Arg Ala Ala Met Leu Ile Lys Met Ile Leu Lys Lys Asp  
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Asn Asp Ser Tyr Val Ser Phe Tyr Asn Ala Leu Leu His Glu Gly Tyr  
65 70 75 80

5 Lys Asp Leu Ala Ala Leu Leu His Asp Gly Ile Pro Val Val Ser Ser  
85 90 95

Ser Ser Gly Lys Asp Ser Val Ser Gly Ile Thr Ser Tyr Val Arg Thr  
100 105 110

10 Val Leu Cys Glu Gly Gly Val Pro Gln Arg Pro Val Val Phe Val Thr  
115 120 125

Arg Lys Lys Leu Val Asn Ala Ile Gln Gln Lys Leu Ser Lys Leu Lys  
15 130 135 140

Gly Glu Pro Gly Trp Val Thr Ile His Gly Met Ala Gly Cys Gly Lys  
145 150 155 160

20 Ser Val Leu Ala Ala Glu Ala Val Arg Asp His Ser Leu Leu Glu Gly  
165 170 175

Cys Phe Pro Gly Gly Val His Trp Val Ser Val Gly Lys Gln Asp Lys  
180 185 190

25 Ser Gly Leu Leu Met Lys Leu Gln Asn Leu Cys Thr Arg Leu Asp Gln  
195 200 205

Asp Glu Ser Phe Ser Gln Arg Leu Pro Leu Asn Ile Glu Glu Ala Lys  
30 210 215 220

Asp Arg Leu Arg Ile Leu Met Leu Arg Lys His Pro Arg Ser Leu Leu  
225 230 235 240

Ile Leu Asp Asp Val Trp Asp Ser Trp Val Leu Lys Ala Phe Asp Ser  
245 250 255

5 Gln Cys Gln Ile Leu Leu Thr Thr Arg Asp Lys Ser Val Thr Asp Ser  
260 265 270

Val Met Gly Pro Lys Tyr Val Val Pro Val Glu Ser Ser Leu Gly Lys  
275 280 285

10 Glu Lys Gly Leu Glu Ile Leu Ser Leu Phe Val Asn Met Lys Lys Ala  
290 295 300

Asp Leu Pro Glu Gln Ala His Ser Ile Ile Lys Glu Cys Lys Gly Ser  
15 305 310 315 320

Pro Leu Val Val Ser Leu Ile Gly Ala Leu Leu Arg Asp Phe Pro Asn  
325 330 335

20 Arg Trp Glu Tyr Tyr Leu Lys Gln Leu Gln Asn Lys Gln Phe Lys Arg  
340 345 350

Ile Arg Lys Ser Ser Ser Tyr Asp Tyr Glu Ala Leu Asp Glu Ala Met  
355 360 365

25 Ser Ile Ser Val Glu Met Leu Arg Glu Asp Ile Lys Asp Tyr Tyr Thr  
370 375 380

Asp Leu Ser Ile Leu Gln Lys Asp Val Lys Val Pro Thr Lys Val Leu  
30 385 390 395 400

Cys Ile Leu Trp Asp Met Glu Thr Glu Glu Val Glu Asp Ile Leu Gln  
405 410 415

Glu Phe Val Asn Lys Ser Leu Leu Phe Cys Asp Arg Asn Gly Lys Ser  
420 425 430

5 Phe Ser Leu Leu Phe Thr  
435

10